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Vocabulary acquisition in the middle grades: a conceptual approach

Patricia L. Paige

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VOCABULARY ACQUISITION IN THE MIDDLE GRADES: A CONCEPTUAL APPROACH

A Project Submitted to
The Faculty of the School of Education
In Partial Fulfillment of the Requirements of the

Degree of

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Education: Reading Option

By

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SUMMARY

This project provides teachers with a variety of teaching methods and strategies for vocabulary instruction in the middle grades. The learning activities involve students with listening, speaking, reading, and writing. Some methods are based on quality classroom discussions managed by the teacher, while others foster student cooperation on group tasks. The power of learning through the arts is employed in activities using drama, music, and art. There are many strategies which students can learn to use as they become independent learners. A strong emphasis is placed on fostering student interest in vocabulary acquisition through activities designed to heighten student interest and participation.

Students in the middle grades must learn many thousands of new words per year beyond the demands they faced in the primary grades. For the first time in their academic careers they are expected to read content area texts and rapidly learn many complex concepts. Middle grade students have to read more sophisticated literature selections about people, places, and events which are unfamiliar to them.
A review of the literature supports instruction based on schema theory, the interactive nature of the reading process, whole language teaching, and the use of metacognitive strategies. Teachers need to learn to assess their students' background knowledge prior to instruction so they can best identify which words in a selection need to be directly taught. Secondly, teachers need to choose appropriate vocabulary teaching methods based on their students' background knowledge and the material to be learned. Finally, teachers need to encourage students to become strategic readers and learners.
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INTRODUCTION

A crucial component of the elementary reading program is vocabulary acquisition. In the middle grades it becomes even more critical, because students are expected to read more complex text than they met in the primary grades. Beginning in fourth grade students encounter more difficult content area material and more sophisticated literature. They must expand their vocabularies not only by thousands of words per year, but to a thorough understanding of the concepts represented by the new words. This project will explain how vocabulary is acquired through a conceptual approach. The purpose of this project is to provide middle grade teachers with strategies and methods based on schema theory to instruct their students in vocabulary development across the curriculum.

The benefits of a strong vocabulary development program for students are three-fold. First, a larger vocabulary will enable students to better comprehend the reading texts they must master. The ability to understand difficult texts in turn provides the students with greater access to the basic knowledge of their culture and a greater ability to succeed academically. Second, a deep knowledge of vocabulary
meanings will help students to appreciate figurative language and idiomatic expressions, giving them a better opportunity to enjoy their literary heritage. Finally, students with wider vocabularies are better able to express themselves both orally and in written work.

The challenge for middle grade teachers is to employ the best strategies and methods to help their students master the vocabulary required for success in their curriculum. Guidelines for a vocabulary program based on schema theory have been proposed as follows by Carr and Wixon (1986, p. 589-592):

1. Instruction should help students relate new vocabulary to their background knowledge.
2. Instruction should help students develop elaborated word knowledge.
3. Instruction should provide for active student involvement in learning new vocabulary.
4. Instruction should develop students' strategies for acquiring new vocabulary independently.

Existing vocabulary instruction does not meet these criteria (Blachowicz, 1987; Graves, 1989).
Blachowicz observed fourth grade basal reading lessons, including pre-reading vocabulary activities. Vocabulary instruction accounted for 19% of the time spent in the basal lesson, but the instructional focus was on definitions and words in contexts unrelated to the reading selection itself. Blachowicz found a "lack of attention to the development of independence in gaining word meaning, or towards generalized strategies for figuring out words" (p. 135). The teachers were interviewed following classroom observations, and although they were not satisfied with the basal vocabulary program, the teachers said they were unaware of ways to improve vocabulary instruction in their classrooms.

Most basal reader programs do at least include some vocabulary development activities for the teacher to use with reading selections. Most content area texts, however, only provide a word list for the chapter or lesson and an end-of-book glossary for the students. As Nagy (1988) says, "most of the content words in the definition are less likely to be familiar to the student than the word" under study itself (p. 4). In addition, Nagy points out that "definitions do not teach you how to use a new word" (p. 4). Middle grade teachers are quite familiar
with students who memorize glossary definitions to pass matching tests, but who are unable to apply their new vocabulary to writing or speaking tasks, and are unable to understand the terms in a new context.

The main approach to vocabulary development represented by existing basal readers and content area textbooks is the definitional approach as explained by Herman and Dole (1988). The authors defend its use only "when students already know the underlying concept or closely related words or concepts" (p. 46). Stahl (1986) further recommends that teachers include the use of synonyms, antonyms, structural analysis, and classification to help students reach a deeper level understanding of the definition. These methods are in agreement with schema theory which says learners combine new information with background knowledge to expand an existing schema.

Anderson and Freebody (1979) identified three schools of thought related to vocabulary instruction, the aptitude, instrumentalist, and knowledge positions. Those who accept the aptitude hypothesis believe the ability to learn language is determined at birth and schools must try to help each student
reach his/her inborn potential through a great deal of drill and practice. The instrumentalist position is represented by the definitional approach explained above. In contrast, the knowledge hypothesis "emphasizes conceptual frameworks or 'schemata;' individual word meanings are merely the exposed tip of the conceptual iceberg" (p. 5). Vocabulary knowledge is highly correlated with both reading comprehension and general world knowledge by many researchers (Anderson and Freebody, 1979). The knowledge hypothesis is closely related to schema theory, supports whole language instruction, and it is the approach advocated by this project.

A schema, according to Rumelhart (1981), is "a data structure for representing the generic concepts stored in memory. There are schemata representing our knowledge about all concepts; those underlying objects, situations, events, sequences of events, actions and sequences of actions" (p. 5). Each schema includes the total network of related ideas concerning a concept. The implications for vocabulary instruction are enormous. Each new word or concept learned takes its place in an existing schema, or helps create a new one. The extent to which the new word or concept is learned will affect
its relationship to the entire set of interrelated ideas within a schema. Teachers must help their students access their existing schema when encountering new vocabulary so the new learning will connect with prior knowledge.

In a model of the interactive reading process Ruddell (1986) demonstrated how the reader accesses prior knowledge during reading, and how dependent comprehension is on his/her ability to relate the text to prior knowledge. This view of reading may help explain the close relationship between vocabulary knowledge and reading comprehension observed on test scores. Ruddell claims that intent to learn new vocabulary is of primary importance to a student's success. He declares, "Establishing motivation and desire to acquire new vocabulary is at the very heart of vocabulary acquisition" (p. 587).

In addition to their primary concern with cognitive learning, teachers must also take responsibility for instilling their students with a desire to learn.

The need for this project is demonstrated by Blachowicz'z (1987) discovery of the lack of adequate vocabulary instruction in middle grade reading programs and the lack of schema-based instructional methods in the current textbooks. Schema theory, as
described by Rumelhart (1981), explains how new vocabulary becomes associated with prior knowledge in the student's mind, thereby supporting schema-based vocabulary instruction. The benefits of concept-based vocabulary instruction in the interactive reading process are demonstrated by Ruddell (1986). The standards for an effective vocabulary program as established by Carr and Wixon (1986) have been met by this project. The strategies and methods promoted by this project follow the knowledge hypothesis (Anderson and Freebody, 1979) in which vocabulary instruction is based on schema theory. This project also addresses both cognitive and affective (Ruddell, 1986) aspects of teaching and learning.

Although this project is designed for use by middle grade teachers, its methods and strategies can be adapted to upper grades or secondary school instruction as well.
REVIEW OF THE LITERATURE

Introduction

Vocabulary acquisition is essential to both reading instruction and content area instruction. A student's vocabulary has consistently been found to predict both reading level and intelligence scores on standardized tests (Anderson and Freebody, 1979). This high correlation demonstrates the advantages students with high vocabularies are likely to enjoy in their academic careers.

This review of the literature will begin with a description of the historical development of vocabulary instruction in America from its beginnings in Colonial America to the present time. Current learning theories underlying vocabulary instruction will be considered, including psycholinguistics, the schema theory of learning and the interactive nature of the reading process. Three major instructional issues, the identification of appropriate vocabulary for instruction, depth of word knowledge, and the effectiveness of a variety of teaching methods, will be discussed.
Historical Development of Vocabulary Instruction

The earliest reading texts for children in America were based on the Bible, since the focus of education was to teach religious principles. There was no concern for the difficulty of the vocabulary used in the texts. By the early nineteenth century, however, text content and vocabulary were influenced by the naturalistic educational philosophy begun in Europe by Rousseau and Pestalozzi (Venezky, 1987). A child nurture movement spread in the United States in which childhood experiences became the subjects of stories for children. The McGuffy Readers which were used widely throughout the United States presented their young readers with tales of childhood activities. The vocabulary better reflected the young readers' familiar everyday language.

Vocabulary was further controlled through the adoption of Webster's blue-back speller which limited the number of syllables contained in introduced words. Reading primers such as the McGuffy Readers contained many fewer new words by the end of the 1820's (Venezky, 1987). Students were first taught to read phonetically regular words, which provided a severely limited vocabulary for story content. This controlled vocabulary approach remained strongly in
command of the basal reading programs well into the twentieth century.

John Dewey's Progressive Movement, which was an innovation in the second half of the nineteenth century, emphasized relating classroom instruction and content to the real world experiences of the students. He declared, "The delight that children take in demanding and learning the names of everything about them indicates that meanings are becoming concrete individuals to them" (Dewey, 1933, p. 232). He advocated teaching vocabulary through meaningful experiences, not stilted definitions. He perhaps anticipated schema theory when he wrote, "...the fundamental difficulty is not with the word, but with the idea" (p. 245). Dewey advised teachers to provide students with many opportunities to express themselves orally and in writing to develop their vocabularies more naturally.

By the early twentieth century the scientific movement came into vogue and gave further strength to controlled vocabulary in student texts. Behaviorists supported stimulus-response instruction in which students were taught by the "whole word method" in which they learned to read one word at a time with no context. Venezky (1987) reported, "So long as
behaviorism remained the dominant educational psychology, little was done to promote comprehensive strategies aside from emphasizing the repetition of vocabulary and pressing for more immediate association responses from the child" (p. 257).

Word frequency counts began with Thorndike's work in the early 1920's (Venezky, 1987). This attempt to determine which words students needed most to know actually resulted in teaching them fewer words. The sight word list approach became an integral part of many reading programs. Students drilled on a limited number of words with no context for assistance. Students were not expected to study new vocabulary words until they were proficient readers. This movement was carried to such an absurd extreme that children's literature was actually rewritten to simplify the vocabulary when such materials were used in basal readers. Stories written specifically for inclusion in basal reading programs were nearly devoid of all meaning as an extremely limited number of words were used.

The definitional vocabulary teaching method fit Behaviorist theory well. This approach was designed to present students with correct meanings of new words which students were to memorize in a
stimulus-response learning manner. It was believed that knowledge of a word's definition would provide the student with an adequate understanding of the word. This method has persisted for decades in basal reading programs and in content area instruction as well. Research into the schema theory of learning demonstrates that the use of the definitional method should be restricted to situations in which the students have sufficient background knowledge that a definition would be adequate to assist comprehension.

The current movement toward literature-based reading instruction rejects the controlled vocabulary approach. Students learn to read using real literature rather than basals with artificial language patterns and restricted word counts and vocabularies. Students learn to access their background knowledge to comprehend as they read. Using metacognitive strategies, each reader can learn to realize which words s/he does not know in a text and then apply strategies to determine a meaning of the unknown word in the given context. Students are taught words in semantically related groups when direct instruction is necessary. Rather than learning to recognize or write dictionary definitions, students are encouraged to develop their
own definitions using synonyms, antonyms, and personal experiences related to the concept.

Children learn language by listening, speaking, reading and writing with natural language, not artificially controlled language. Whole Language teaching advocates meaning-based instruction in the language arts with integration of content areas. The use of quality literature and content texts or resource books and materials means children learn to read from natural language texts in which vocabulary is not controlled, but is as expressive as the best oral language the children encounter.

**Theories Underlying Vocabulary Acquisition**

Because of the close cause-effect relationship between vocabulary knowledge and reading comprehension, vocabulary acquisition has traditionally been studied through its effect on reading comprehension. Theorists can be distinguished as those who believe the reader must first know the meanings of the words in order to comprehend a passage, and those who believe the passage gives meaning to the words it contains. These two positions are otherwise known as "bottom-up" processing and "top-down" processing.
Schema theory supports "top-down" processing. Schema theory holds that each person has many schemata stored in memory and that these schemata constitute a person's prior knowledge. Rumelhart (1981) wrote, "our schemata are our knowledge. All of our generic knowledge is embedded in schemata" (p. 13). The appropriate schema is accessed when new information is encountered, and the new knowledge helps expand an existing schema with additional concepts.

Understanding of schema theory began with Piaget (Klein, 1988) who defined children's stages of learning. Piaget theorized that new learning does not simply accumulate in the mind, but that it associates with prior knowledge stored there or, "if the new information is dramatically new or different, one then adjusts the schema so that it is essentially altered both in general contour and in detail; i.e., one accommodates the new learning" (p. 6-7).

The Piagetian developmental stage achieved by middle grade students is the stage of Concrete Operations (Smith, Goodman, and Meredith, 1970). The authors reported, "The key to this stage is use of the concrete. The child develops the capacity to conserve one attribute or idea while he is
considering another. He can accomplish groupings and serializations in space, in time, and in number. He can keep at least two variables in mind as he considers categories or classes" (p. 125). In this developmental stage children are able to compare and contrast new vocabulary words with prior knowledge as they consider the relationships and associations of new terms with their existing schemata.

Because children have developed these abilities by the middle grades, teachers must also be alert for a metacognitive problem described by Balajthy (1988). He explained, "Readers tend to interpret what they read -- correctly or incorrectly -- according to their existing knowledge structures. They tend to disregard statements that challenge their beliefs" (p. 5). When teachers realize that their students may fall into this trap, vocabulary and concept instruction must be designed to help students restructure their existing schemata or to create an entirely new schema to accommodate the new information. Balajthy explained that this problem becomes especially significant in science instruction since students encounter so many new concepts and such extensive vocabularies in that content area.
Teachers in the content areas may also incorrectly assume students have a reading problem when the real difficulty lies with the students' lack of adequate background knowledge to understand the text. The need for establishing adequate background knowledge is so strong that Stansell and DeFord (1981) wrote, "comprehension is as much a function of what readers know before they read as it is of the information that a particular selection actually contains" (p. 16).

Rumelhart (1981) discussed the need for restructuring of schemata when new information does not agree with the learner's existing schema. He said, "It is interesting that schemata not only contribute towards development of an accurate perception but, by the same token they can sometimes cause a distortion" (p. 21). When the student interprets a text relying on an existing schema that does not fit the text, confusion will result. Teachers must be prepared to provide direct vocabulary instruction when their students do not possess the necessary schema to process what they read or when the teacher believes they may access the wrong background knowledge for the text. How to
Identify appropriate vocabulary for instruction will be discussed in another section of this paper.

Goodman (1968) has investigated the psycholinguistic nature of the reading process, concluding that reading "must be regarded as an interaction between the reader and written language, through which the reader attempts to reconstruct a message from the writer" (p. 17). Before this understanding was reached, most researchers thought of reading as a direct process in which a writer communicated his/her ideas to the reader. The reader's thought processes were not thought to have any bearing on the text; reading was equated with decoding the written text into oral language. As Goodman pointed out, however, that is not a sufficient description of the reading process. He wrote, "decoding must involve some level of comprehension of the entire meaning of large language units. Nothing less than decoding of large language units is reading. Even in the lowest proficiency level the child must be able to get meaning" (p. 18).

The interactive nature of reading requires that the reader bring to the text his/her own background knowledge of the topic, that s/he be able to decode the written text, and that s/he interpret the
author's message in light of his/her background knowledge. Klein (1988) explained, "This is what effective reading is about - using contextual assistance provided by (a) the text, its structure, and content, and (b) background knowledge and prior experience to impose meanings on unfamiliar words" (p. 78).

Implications for instruction based on the interactive nature of the reading process have been described by Ruddell (1986). He explained that the teacher must direct students' attention to the text, help them assess and activate their prior knowledge, and teach them strategies to develop new concepts as they read independently. Ruddell created a model of the reading process (See Appendix A) which demonstrates the interactive nature of the process. Ruddell concluded, "comprehension and vocabulary development [is] an interactive process. Since many new words are encountered in written text, comprehension of the text must occur before vocabulary learning takes place. In effect, the new concepts are nested in the meaning context in which they appear" (p.587).
Instructional Issues in Vocabulary Acquisition

Teachers' instructional decisions about vocabulary development center around three major concerns. One is how to best identify which vocabulary words should be taught directly. A second concern is determining the depth of word knowledge required before a student "owns" a new word. The third issue deals with the most effective methods and strategies for vocabulary teaching.

Identifying Words for Vocabulary Instruction

Researchers have attempted to count the total number of words which students must master. Nagy and Herman (1987) determined that the total vocabulary of an average high school student is about 40,000 words (p. 21). That total implies students learn more than 3,000 words per year during their school careers. The limited time available for vocabulary instruction obviously precludes direct instruction of so many words. Nagy and Herman concluded that most vocabulary learning takes place through repeated exposure to words in both oral and written contexts. They wrote, "Incidental learning of word meanings from written context may therefore account for a large proportion of the annual vocabulary growth of
those students who do read at all regularly" (p. 26). They therefore recommended that teachers should provide a regular silent reading time during the school day to promote vocabulary learning from written context.

Although students apparently do learn many new words through extended reading, they may not have the ability to get an accurate or deep level understanding of a word simply through context alone. Some direct instruction is required, especially for many terms students encounter in content area instruction. In a later study, Nagy (1988) concluded that the "resolution lies in the teacher's ability to make efficient use of vocabulary instruction -- to identify which words and concepts are likely to pose serious difficulties for the students, and to identify what type of difficulties these are, and what instructional remedies are most appropriate" (p. 16).

In order to identify which words in a given text are most appropriate for direct instruction, teachers should consider several factors. Kapinus (1987) discussed several criteria for selecting the best words for an instructional program. She described three tiers of vocabulary knowledge: 1) high
frequency, very basic words; 2) extremely low frequency words; 3) frequently encountered words connoting a mature level of literacy. Words in the first tier need not be taught since they will be learned in everyday contexts. Words in the second tier need only be taught when needed for comprehension in a specific context. The third group, however, are those words which teachers must stress in their instruction. Kapinus recommended that teachers should select semantically related words to help students develop their schema networks more effectively.

**Depth of Word Knowledge**

The extent to which a student knows a word ranges from a vague familiarity with one meaning to the ability to recognize and use the word in a variety of oral and written contexts. Beck, Perfetti, and McKeown (1982) defined three levels of word knowledge: at the lowest level no complete meaning is stored in memory; at the intermediate level, meaning is accessed only with effort; at the highest level, at least some meanings are automatically accessed (p. 507). The authors explained, "words are just labels for concepts. If
one’s understanding of a concept is rich enough, the access to contextually relevant components can occur easily in the right context. If one’s understanding of a concept is more impoverished, access to some components may be rapid, but access to other components either will not be possible or will be the result of slower constructive retrieval processes” (p. 508). The implications for instruction are that teachers must help their students connect new words with a network of concepts to develop deep word knowledge.

Although deep word knowledge is desirable, it may not always be necessary for reading comprehension to occur. Kameenui, Dixon, and Carnine (1987) differentiated between prompted and unprompted recall. In prompted recall, "a reader could come across a vaguely familiar word, one that had been encountered elsewhere but not retained well, and utilize the context to prompt recall of that word at some level" (p. 135). By contrast, unprompted recall "is over-learning with respect to normal reading because the recall requirements upon the reader are greater than those imposed by normal reading, which always involves context to some extent" (p. 135). Teachers need to determine the depth of knowledge
required for their students to accomplish the learning task at hand; when students need only comprehend a story the level of knowledge required will be less than when they will be required to perform speaking or writing tasks with the target word/s.

**Effectiveness of Vocabulary Instruction**

Many methods of vocabulary instruction have been designed. Some rely on complex mnemonic associations, such as the keyword method. Others rely on simple associations with definitions or synonyms and antonyms. Many context strategies using both instructional and natural contexts are described in the literature. Schema-based methods and strategies are conceptual approaches which emphasize the need to relate new words to prior knowledge, and to learn words in related groups. These methods and strategies have been tested for effectiveness in a variety of classroom research studies.

Definitional approaches are traditionally encountered in basal readers and content texts. Students are provided with definitions for the words under study, or are directed to locate definitions in a dictionary or glossary. Often they are required to
fill in cloze sentences with the words or to write original sentences with the new words. The nature of dictionary definitions, however, restricts the amount of information the reader can gain about a word's use in context. This approach is best used when the student already knows the concept for the new word and simply needs to associate the new word with the known concept. The new word will become part of his/her vocabulary as it is met repeatedly in context, and the working definition will be expanded and deepened in each reading.

Gipe (1979) compared the effectiveness of the dictionary definition approach to three other techniques: a) association of the new word with a known synonym; b) categorizing the new word in a list with known words; c) an instructional context method in which sentences were deliberately written to provide an appositional definition. She found that the context method was significantly more effective for both test groups of third and fifth grade students. Gipe concluded, "The results of this study would seem to suggest support for the interactive model. This would imply that the familiar context guided each learner to the 'old information' present in his or her conceptual base; that the target word
could then be assimilated into the system on the basis of individual background experiences; and that the learner was not only provided with a definition of the target word but with the context in which the words appear" (p. 640). Neither the categorizing approach nor the definitional approach were as effective as association with a synonym or learning a word in context.

Teaching students to effectively use context clues is a critical component of any vocabulary development program. Students need to recognize which context clues are present in a passage as well as determine which unknown words are hindering their comprehension. Sternberg (1987) explained the close relationship between reading comprehension and vocabulary knowledge in this way: "Whereas vocabulary is an indirect measure of ability to learn word meanings in context, reading comprehension is a fairly direct measure of ability to learn concepts in context" (p. 90). He described eight types of context clues which readers must recognize:

1. Temporal cues: duration or frequency of X
2. Spatial cues: location of X
3. Value cues: worth or desirability of X
4. Stative descriptive cues: properties of X
5. Functional descriptive cues: purpose of X
6. Causal/Enablement cues: causes of or enabling conditions of X
7. Class membership cues: classes to which X belongs
8. Equivalence cues: meaning of X, or contrasts to X

In order for the use of the clues to be effective, Sternberg said the reader must be able to use them both spontaneously and automatically. He advised teachers to directly teach the meaning and use of these clues through examples from whole texts so the students will be able to apply these strategies in their own reading beyond the classroom. A student's use of context clues is especially important to his/her ability to determine the meaning in context of multiple meaning words. It is only through many encounters with such words in a variety of contexts that students develop deep understanding of both denotative and connotative meanings.

The definitional and contextual methods have been the traditional approaches to vocabulary instruction. As Hodges (1984) wrote, however, there is "an important difference between knowing words and understanding their broad range of uses and referents. For vocabulary development is first and foremost a matter of concept development" (p. 3).
The conceptual approach is an approach in which new words are learned in relation to known concepts and concept groups. This approach is based on schema theory (Rumelhart, 1981).

Reading is currently viewed as an interactive process (Ruddell, 1986) in which the student activates his/her background knowledge of the topic of the text and uses metacognitive strategies to assess his/her on-going comprehension. If comprehension breaks down s/he will use a variety of strategies to determine why and what is the best way to recover meaning. This understanding of the relationship of new learning to background knowledge supports teaching vocabulary with a conceptual approach.

Marzano (1983) developed an extensive vocabulary list organized into 430 clusters of related concepts, containing 7,000 of the most frequently occurring words in elementary school textbooks. He intended his list as a reference guide for teachers to use when they were teaching various units of study. Marzano advocated that teachers should teach vocabulary in concept groups by brainstorming word lists about a given topic with the class and discussing the placement of each word in a given
cluster. The students would follow this discussion with a variety of activities using the words from their list and would study derivational forms of the words as well. The approach elicits background knowledge from the students as a whole group, and many individuals would be introduced to new words known by their peers. The discussion period calls for students to use higher order thinking skills to discover relationships among words related to a given topic. Students would also be expected to have a greater interest in learning new words generated by their classmates than those listed in a textbook. This affective component has also been addressed in other studies.

The effectiveness of teaching words in semantically related groups was demonstrated in a study conducted by McKeown, Beck, Omanson and Pople (1985). The authors examined student learning using a semantic approach in which new words were grouped into two related categories of twelve words each. There were three treatment groups: 1) the first group received rich instruction with concept development through identifying relationships among and between words; 2) the second group received the same instruction as the first with the addition of a
motivational "word wizards" activity in which students collected words which interested them; 3) the third group received traditional instruction and served as the control. Although there was little difference in knowledge of definitions on a post-test among the three treatment groups, students in the second group "developed elaborated word meanings ...which apparently resulted in the development of semantic networks around the learned words" (p. 533). These students were observed to use the target words "spontaneously in natural contexts outside of class" (p. 533). This display of ownership of new words is the prime goal of vocabulary instruction.

Beds and Cockrum (1985) developed an even more extensive interactive lesson plan in a study conducted with fifth grade students. The first group was the Teacher Interaction Group in which a great deal of discussion helped students relate the target words to their prior knowledge. The second group was a Dictionary Group which was instructed to find definitions and copy them. The final group was the Control Group who read the target words in the context of literature selections and then worked on related activities. Students in the Teacher Interaction Group had the best vocabulary retention
on both the immediate post-test and the delayed retention test. The authors proposed that teachers adopt a four-step instructional model in which students would:

1. Identify and discuss their background knowledge of the target word
2. Write a personal experience related to the target word
3. Write a non-example of the target word
4. Write their own definition of the target word

Personalizing instruction to this extent is designed to develop positive affective responses to vocabulary acquisition.

The effectiveness of many instructional methods and strategies such as those discussed above were reviewed by Herman and Dole (1988). They concluded that "the definitional and contextual approaches used alone are not as effective as a combination of the 2 [sic] in improving comprehension. The conceptual approach builds more thorough word knowledge" (p. 43) than the other two singly or in combination. However, the authors stressed the importance of the teacher as a decision maker in the process. "Appropriate instruction most often depends on the to-be-learned words and the given text for which a
word is important. Sometimes students can simply be given definitions of words and such knowledge is sufficient for understanding words and for enhancing comprehension of a given text. Other times students will need a strategy for using context to figure out word meanings in order to maintain comprehension. At still other times, students will need more extensive instruction to learn new words because definitions alone and context alone are not sufficient for a thorough enough understanding of words crucial to comprehending a given text" (p. 51).

Graves (1987) outlined a three-part plan for vocabulary instruction including Learning Words, Learning to Learn Words, and Learning About Words (See Appendix B), but he ultimately concluded, "the instruction I envision is in the majority of cases teacher-directed, active teaching that involves a good deal of explicit teacher talk. ...I envision teachers who themselves appreciate words and the English language more generally, who are knowledgeable about language, and who are precise in their diction and articulate in their speech and writing. Without such teachers, the plan outlined here would be of no value; with such teachers, it can
become far more than anything that can be put down on paper" (p. 181).

Conclusion

The problems of vocabulary acquisition have been better defined in recent years due to the development of cognitive learning theories which underlie the current understanding of the interactive nature of the reading process. Teachers who have felt the definitional approach was unsuccessful were correct; now they can learn more successful methods and strategies to instruct their students. The definitional approach may be used when appropriate. Many context strategies can be taught so students will learn to determine a meaning for new words in a passage. Teachers must assume a greater role in directly teaching critical vocabulary through conceptual methods such as those presented in this project.
GOALS AND LIMITATIONS OF THE PROJECT

This project provides teachers with a handbook of instructional methods and strategies for teaching vocabulary development in the middle grades. The contents are designed for use with students in regular classes, either heterogeneous or homogeneous. The scope of the project includes both language arts and content areas, as both narrative and expository forms are addressed. A wide range of both oral and written activities are included. Methods and strategies cross the four language areas of listening, speaking, reading, and writing. Activities in music, drama, and art are included. Math vocabulary is considered in a separate section due to the special needs of that subject area.

This project is not a "vocabulary program" with worksheets and predetermined word lists to master. It is not intended to provide teachers with ready-made lessons. Teachers must carefully select the appropriate method or strategy to use with their given lesson. Teachers must have a thorough knowledge of their curriculum and be able to assess their students' vocabulary needs.
Teachers who use the handbook need to be familiar with schema theory, Whole Language instruction and the interactive nature of the reading process. The methods and strategies have been selected on the basis of their alignment with those approaches.

Based on the research cited in the review of the literature, teachers need to identify which words are appropriate for direct instruction, determine the depth of word knowledge needed for the instructional task at hand, and choose the best methods and strategies for their vocabulary program.

Teachers who use the handbook should expect that their students will develop a sense of word awareness, or a positive affective response to vocabulary acquisition. Students will use a wider range of vocabulary in their oral and written work, and their comprehension of both narrative and expository prose will be enhanced.

This project is not intended for ESL students who have special language development needs; nor is it meant for students in special education programs. Nevertheless, teachers of such students may find selected methods or strategies which may be beneficial for their students.
Although the project is targeted at the middle grades, teachers of primary, upper grades or high school might also find methods or strategies which could be adapted for use in their programs.
REFERENCES


APPENDIX A

A Model of the Interactive Reading Process

DECLARATIVE AND PROCEDURAL KNOWLEDGE

Decoding → World
Language

KNOWLEDGE UTILIZATION AND CONTROL

Affective State
goal direction; content & time expectations

Cognitive State
plan of action over time

Metacognitive State
monitor & evaluate

READER ENVIRONMENT

Textual Features
Conversational Features
Instructional Features

A teacher/text/student interaction
B student's memory
C student's text representation
D text comprehension
E storage of new knowledge

Affectiver State Text Representation
processing & meaning of a text to a given time

READER PRODUCT

1. Comprehension
2. Word Recognition
3. Oral Output
4. Written Output
5. Affective State Change
6. Cognitive State Changes
7. Metacognitive State Change
8. New Knowledge

Ruddell (1986, p. 583)
THREE PART PLAN FOR LEARNING WORDS

Learning Words:
Learning to read unknown words
Learning new meanings for known words
Learning new words representing known concepts
Learning new words representing new concepts
Clarifying and enriching the meanings of known words
Moving words from receptive to expressive vocabularies

Learning to Learn Words:
Using context
Learning and using word parts
Using the dictionary and thesaurus
Developing an approach to dealing with unknown words
Adopting a personal approach to building vocabulary

Learning about Words:
Learning what it means to know a word
Learning that word meanings vary and how they vary
Recognizing and manipulating relationships among words
Learning to recognize and use figurative language
Learning to value words

(Graves, 1987, p. 167-180)
APPENDIX C

HANDBOOK OF STRATEGIES AND METHODS
FOR TEACHING VOCABULARY
IN THE MIDDLE GRADES
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Introduction

A crucial component of the elementary reading program is vocabulary acquisition. In the middle grades it becomes even more critical, because students are expected to read more complex text than they met in the primary grades. Beginning in fourth grade students encounter more content material and more sophisticated literature. They must expand their vocabularies not only by thousands of words per year, but to a thorough depth of understanding of the concepts represented by the new words.

The benefits of a strong vocabulary development program for students are three-fold. First, a larger vocabulary will enable students to better comprehend the reading texts they must master. The ability to understand difficult texts in turn provides the students with greater access to the basic knowledge of their culture and a greater ability to succeed academically. Second, a deep knowledge of vocabulary meanings will help students to appreciate figurative language and idiomatic expressions, giving them a better opportunity to enjoy their literary heritage. Finally, students with wider vocabularies are better
able to express themselves both orally and in written work.

The challenge for middle grade teachers is to employ the best strategies and methods to help their students master the vocabulary required for success in their curriculum. This handbook meets the guidelines for an effective vocabulary program established by Carr and Wixon (1986, pp. 589-592):

1. Instruction should help students relate new vocabulary to their background knowledge.
2. Instruction should help students develop elaborated word knowledge.
3. Instruction should provide for active student involvement in learning new vocabulary.
4. Instruction should develop students' strategies for acquiring new vocabulary independently.

Teachers who use this handbook should become familiar with the whole language teaching model, the schema theory of learning, and the interactive nature of the reading process. The handbook does not contain ready made worksheets, lessons plans, or comprehensive word lists. The successful use of this
handbook depends on a knowledgeable teacher who is adept at facilitating student discussions, who has a thorough knowledge of the concepts across the curriculum, and who has a deep commitment to teaching students how to learn as well as what to learn.

Not all methods and strategies presented here should receive equal emphasis in the classroom. Teachers need to be selective in choosing which to implement. Some activities are designed for use with narrative, others with expository reading passages. Some oral discussion methods are best used to promote interest in vocabulary development, others stress higher thinking skills in determining word relationships. Teachers using the handbook need to evaluate the possible benefits for their students in implementing strategies and methods contained therein.

During the course of a school year it would be wise to introduce students to a variety of strategies since what works best for some students may not work as well for others. Instruction will be enriched through a variety of approaches, and student interest will be easier to maintain at a high level.
ASSOCIATION METHODS

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Introduction

The methods contained in this section promote association of new vocabulary with prior knowledge, related groups of terms under study in a unit, and direct experience. Linking new words with known synonyms or antonyms ties the new knowledge to existing schemata. Studying groups of related words through a conceptual approach provides the students with new schemata while expanding or restructuring existing schemata. Direct experiences provide the students with a sensory approach to learning new vocabulary.

Teachers need to select which methods will prove most productive to the lesson at hand. In some cases students will compile study cards or construct diagrams showing a word's relationship to other terms. In other cases classroom discussion will be more useful. There are a variety of activities including listening, speaking, reading, and writing to engage the students' total language abilities. The methods in this section are somewhat traditional, relying on teacher-provided definitions or student-generated definitions and familiar synonyms; however, stilted dictionary definitions learned in
Isolation from text are not appropriate. Students who have received definitional vocabulary instruction in the past may need help from the teacher to understand why conceptual methods will be more successful.
Word Cards

Students can select words which interest them, or words can be selected by the teacher. The students compile a set of study cards, each containing the target word, a personal example related to the target word, and two known synonyms. The cards can be prepared individually or within a group during discussion of the words under study. The association of the new word with a personal experience and known synonyms helps lock in the meaning without use of a stilted definition.

An example of a card written by a student follows. The student related the new word to a poorly behaved neighbor child and two familiar synonyms (Carr and Wixson, 1986).

<table>
<thead>
<tr>
<th>obnoxious</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jonathan</td>
</tr>
<tr>
<td>offensive</td>
</tr>
<tr>
<td>unpleasant</td>
</tr>
</tbody>
</table>
These sample cards come from a student’s selection of words to remember from *Sarah, Plain and Tall* by Patricia MacLachlan:

- **energetic**
  - Coach Hought
- **active**
- **busy**

- **coarse**
  - playground sand
  - rough
  - bumpy

- **whickerling**
  - Thunder
  - horse talk
Vocabulary Overview Guide

Similar to the Word Card method, the Vocabulary Overview Guide (Carr, 1985) requires the student to relate a new word to a personal experience or example and to known synonyms. In addition to these steps, however, the student also records the category or classification to which the target word belongs. This method lends itself to a unit of study in which a group of related words must be mastered. Students should learn to apply this study method independently.
The following set of study cards is based on vocabulary words from a unit on frontier life in America.

<table>
<thead>
<tr>
<th>people</th>
</tr>
</thead>
<tbody>
<tr>
<td>homesteaders</td>
</tr>
<tr>
<td><em>Little House on the Prairie</em></td>
</tr>
<tr>
<td>settlers</td>
</tr>
<tr>
<td>pioneers</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>mining term</th>
</tr>
</thead>
<tbody>
<tr>
<td>bonanza</td>
</tr>
<tr>
<td>TV show &quot;Bonanza&quot;</td>
</tr>
<tr>
<td>a mine full of silver</td>
</tr>
<tr>
<td>sudden good luck</td>
</tr>
</tbody>
</table>
Word Map

The more relationships a student can make between a new word and his/her prior knowledge, the deeper the understanding of the new word will be. In a Word Map (Carr & Wixson, 1986) the student gives examples and short descriptions to help lock in the meaning of a new word. The following examples come from a geography unit.

What is it?

What is it like?

surrounded by water
on three sides

connected to land on
one side

What are some examples?

Florida

Yucutan

Baja, California
What Is It?

- body of water

What Is It Like?

- large body of still water
- natural or man-made
- fresh water

What are some examples?

- Tahoe
- Cahuilla
- Shasta
Subjective Approach to Vocabulary

This method relies greatly on quality classroom discussion. Teachers need to plan the lesson by preparing informative, concept-rich introductions for the words under study. The teacher should always have a working assessment of the extent of the students' overall vocabulary knowledge; this can be accomplished through informal means such as observing classroom discussions and reading student papers.

The SAV helps students relate new words to their prior knowledge, emphasizing a subjective, personal response (Casale & Manzo, 1982). Instead of memorizing a stilted dictionary definition, students are encouraged to relate each word to their own background knowledge. A stimulating class discussion also provides the students with a meaningful language experience in which the teacher models the correct use of the new vocabulary. (See the Discussion Methods section of this handbook.)

The SAV steps are:

1. The teacher introduces the word and its definition, which the students copy on study cards.
2. The students discuss the word and write something the word reminds them of on their cards.

3. The students read the passage containing the target words.

4. The students discuss the passage, using the target words.
Opposition

Association of an opposite or polar meaning with the target word helps strengthen the reader's network of concepts related to a word's meaning. Powell (1986) explained, "Perception of opposition is the active principle of a language act. When once an opposition is established and its principle understood, then either opposite, or any intermediate term, can be at once be defined and delimited by its contradiction or by degree to the opposition" (p. 619).

Powell described three basic forms of opposition. The first type demonstrates a polar opposite as in single/married. The second shows the extremes of a continuum as in dry/wet. The third type represents an undoing as in tied/untied. Teachers need to demonstrate and explain each type and help students recognize examples in their reading. An area of the Word Cards or Vocabulary Overview Guide cards could be assigned to record an antonym to the target word. (Also see the Verbal Seriation/Linear Display Strategy in the Graphic Organizers section of this handbook.)
Affective Responses

Another association students make with new words is an affective, or emotional, response. Part of a vocabulary instruction program devised by Beck and McKeown (1983) required students to call out "yay" or "boo" when the teacher read a list of words containing, for example, "hermit, virtuoso, and miser" (p. 623).

When a fourth grade class read Sid Fleishman's The Whipping Boy they generated the following web of insulting, negative words which the young boys addressed to their kidnappers.

- highwayman
- curs
- fools
- cutthroats
- clods
- outlaws
- ruffians
- murderers
- The Kidnappers
- rogues
- vagabonds
- oafs
- numskulls
- scoundrels
- villains
- dimwits
- outlaws
Mystery Word

A game format activity which helps students link vocabulary words with a network of concepts is Mystery Word (Kaplan and Tuchman, 1980). The teacher selects a word and writes a series of clues about it. She/he reveals one clue at a time on an overhead transparency. Students make guesses based on the clues until the word is correctly identified. Students may work alone or in teams, and points can be given for the first correct answer using the fewest clues. Here are two examples for science vocabulary.

Target Word: aluminum

1. I am a soft, non-magnetic metal.
2. I am found with bauxite deposits.
3. I conduct heat easily.
4. You might find me in your kitchen or automobile engine.
5. Cans made of me are redeemable at a recycling center.

Target Word: circuit

1. I am the path in which electricity travels.
2. Sometimes I'm open and sometimes I'm closed.
3. I am controlled by a switch.
4. On transistors I travel through flat wires.
5. In computers I am contained on a silicon chip.
Direct Experience

Association of a new word with a direct experience is the most effective means of learning vocabulary. Whenever possible teachers should provide students with hands-on activities or with objects or pictures to demonstrate new vocabulary. This procedure was used effectively in a health program on the effects of tobacco on the human body.

Grubaugh and Molesworth (1980) reported on the classroom lessons which demonstrated the meanings of tobacco, nicotine, cigarette, reaction, and abuse. The teacher brought a cigarette smoking machine to class to demonstrate the act of smoking and its effect on the classroom atmosphere. Students dissected a cigarette and took a taste of the raw tobacco. A former smoker came to class and described nicotine addiction. The teacher elicited a reaction from the class by suddenly shouting aloud during a silent work period before giving them a list of twelve bodily reactions to cigarette smoke. All the vocabulary words were discussed in depth. For example, abuse was discussed in respect to its component parts, the prefix ab-, meaning away from, and the root word use.
Teachers need to examine their curriculum for instances in which direct experience can strengthen their vocabulary development program.
Morphemes

Students in the middle grades are challenged to learn many technical terms in science, math, and social studies. Learning the meanings of morphemes, including prefixes, suffixes, and root words, in these special areas of the curriculum will enable them to attach meaning in context when they read textbooks.

Teachers should examine their classroom textbooks to locate words containing morphemes to present to the class prior to reading. Through discussion the students can relate the new word to known words which contain the same morpheme/s. Teachers can find lists of morphemes in reference books and in some textbooks.

Burmeister (1976) recommended that students make morpheme word collections from all the areas of the curriculum to strengthen their associations with the meanings of each morpheme. A minimal list of suggestions from Burmeister (1976) follows (p. 151-153):
### Morphemes

<table>
<thead>
<tr>
<th>ENGLISH</th>
<th>SCIENCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>pre-</td>
<td>-logy</td>
</tr>
<tr>
<td>-logy</td>
<td>epi-</td>
</tr>
<tr>
<td>mono-</td>
<td>multi-</td>
</tr>
<tr>
<td>para-</td>
<td>retro-</td>
</tr>
<tr>
<td></td>
<td>tele-</td>
</tr>
<tr>
<td></td>
<td>ultra-</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MATHEMATICS</th>
<th>SOCIAL STUDIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>-gon</td>
<td>auto-</td>
</tr>
<tr>
<td>-meter/-metry</td>
<td>bl-</td>
</tr>
<tr>
<td>circum-</td>
<td>dem(o)-</td>
</tr>
<tr>
<td>bl-</td>
<td>epi-</td>
</tr>
<tr>
<td>trl-</td>
<td>-gamy</td>
</tr>
<tr>
<td>quad/quadri/quadru-</td>
<td>the(o)-</td>
</tr>
</tbody>
</table>
A Cluster Approach

Applying the research which demonstrates that students learn vocabulary best when new words are learned in related groups, Marzano (1984) developed a list of word clusters. His list includes the 7,230 most commonly used words from word frequency lists. Marzano categorized the words into semantically related clusters applicable to classroom instruction. His final organization falls into three parts, 61 superclusters, 430 clusters, and more than 1,500 miniclusters. Marzano’s list is useful for teacher reference when units of study are developed. Teachers can readily locate vocabulary related to the unit and determine which words are applicable to their students.

A listing of the first fifteen superclusters with some component words follows (p. 170):

1. Occupations  career  manager  mayor
2. Types of action  begin  stillness
   motion
3. Size/ tiny  large  amount
   quantity
4. Animals  pet  dog  snake
5. Feelings/ feeling  terror  shame
   emotions
6. Food types/ food names
   meal

7. Time
   lifetime
   noon
   season

8. Machines/
   equipment
   engine
   oven

9. Types of
   person
   woman
   boy

10. Communication
    explain
    talk
    suggest

11. Transportation
    car
    plane
    Jeep

12. Mental action
    thinking
    wonder
    plan

13. Nonemotional
    human traits
    nice
    lazy
    sure

14. Location/
    direction
    here
    back
    end

15. Literature/
    writing
    story
    novel
    poem
Discussion Methods

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Children first acquire language through listening and speaking. Students need to continue their vocabulary development through discussions which reveal the meaning and use of new words and demonstrate how familiar words are used in new contexts. Relationships among and between words are examined in meaningful discussions. Teachers can facilitate their students' vocabulary acquisition through stimulating discussions based on topics under study or vocabulary contained in literature selections read by the group. Students should be encouraged to use their growing vocabularies in a risk-free environment in the classroom.

Koeller (1981) explained the importance of oral discussion in vocabulary development when she wrote, "Vocabulary is thus emphasized in a realistic, communicative way because children hear, see, discuss, understand, repeat, label, and use related and contrasting words" (p. 139). During discussion students access, expand, and reformulate their existing schemata based on information gained from the verbal interaction among the group.
The discussion methods contained in this section depend for their success on a skillful teacher who knows the students' current language abilities and is able to conduct discussions which maintain focus on the topic and lead to conclusions or resolutions which satisfy the participants. All members of the group should have the opportunity and be encouraged to participate.
Brainstorming

Brainstorming is a way to help students activate their prior knowledge. It is a tool by which the teacher can ascertain the students' current knowledge about a given subject before a unit of study begins. The teacher needs to set a purpose for the brainstorming session before beginning, and decide to what extent s/he will take the brainstorming session.

In its most simple form, brainstorming is a means to establish a word list. The teacher writes the topic on the board and asks the students to tell all the words they know about the topic. The teacher records all the responses on the board. It may suit the purpose better to set aside five minutes for students to record their words individually on paper before contributing to a group list.

Responses may be recorded in a circular manner around the topic word or in a series of columns or at random on the board. Brainstorming is sometimes called "semantic mapping" (Nagy, 1988) because of the visual nature of the displayed responses.

This process can be used to generate word lists prior to a writing session. Less able students may need more assistance in recalling what they know as
they exert themselves to write. Brainstorming provides the teacher with an informal measure of the students' vocabulary. Brainstorming is also a means of demonstrating to all the students the depth and breadth of vocabulary knowledge possessed by their peers in a non-judgmental manner.

Blachowicz (1986) considered the problems faced when the group is not responsive to the brainstorming process or when the teacher is introducing a topic s/he knows is unfamiliar to the students. In those cases, she recommended the use of "exclusion brainstorming" (p. 645) in which the teacher presents a prepared list of words for the students to examine and sort. Students give their rationale for including or excluding words from the list. Students also may suggest additional words for the topic when they can justify their contributions.
List-Group-Label

This extension of the brainstorming process was developed by Taba (in Readence and Searfoss, 1980). Once the students have given about twenty-five responses to the topic, the teacher stops taking suggestions. Then s/he has the group read their list to review all the words. Individually or in small groups the students next select three words from the list which they believe can be semantically related in a sub-category. They report their results to the group, explaining their reasoning. This is a critical step, as the thinking of peers is modeled for the group. Students can develop as many such categories as they can justify. A major benefit of this process is that there are no "right" or "wrong" answers. Students are encouraged to base their groupings on their own thinking.

This discussion method also works well at the end of a unit of study. Students should be able to discern and describe the relationships among the concepts which they have learned in the unit. The following example comes from a unit on the desert.
**Desert**

<table>
<thead>
<tr>
<th>sand</th>
<th>toads</th>
<th>coyotes</th>
<th>cactus</th>
</tr>
</thead>
<tbody>
<tr>
<td>owls</td>
<td>irrigation</td>
<td>rocks</td>
<td>mountains</td>
</tr>
<tr>
<td>wind</td>
<td>palm trees</td>
<td>roadrunners</td>
<td>rattlesnakes</td>
</tr>
<tr>
<td>lizards</td>
<td>tortoises</td>
<td>palo verdes</td>
<td>hot</td>
</tr>
<tr>
<td>quail</td>
<td>sand storms</td>
<td>scorpions</td>
<td>bighorn sheep</td>
</tr>
<tr>
<td>burros</td>
<td>mesquite</td>
<td>dry</td>
<td>rabbits</td>
</tr>
<tr>
<td>doves</td>
<td>javelina</td>
<td>vultures</td>
<td>kangaroo rat</td>
</tr>
</tbody>
</table>

**Food chain:** cactus, lizard, roadrunners

**Things that hurt:** cactus, rattlesnakes, scorpions

**Weather:** wind, hot, dry

**Can fly:** owls, doves, quail

**Endangered:** tortoises, bighorn sheep, (fringe-toed) lizards

**The land:** sand, rocks, mountains

**Brought by people:** burros, irrigation, (date) palm trees
In order to focus the students' attention on the concepts underlying new terms Nagy (1988) recommended that teachers present the concept before revealing the target word. He wrote, "there is the danger of treating these new words simply as new labels, rather than as new concepts...the function of vocabulary that teachers should be more interested in promoting is the way new words enable us to conceive of and express new ideas" (p. 11). In the following example, student interest would be piqued by discussion before they learned the target word (p. 11):

"Have you ever had the feeling that something was going to go wrong, or that something bad was going to happen? Not that you had any good reason to think that -- just a sort of a feeling. Has anyone ever had such a feeling? Did something bad actually happen?"

Following discussion, the teacher would reveal the target word, premonition.
Connect Two

Connect Two (Blachowicz, 1986) is an enjoyable way to stimulate student interest in a reading selection while developing vocabulary concepts. The teacher lists appropriate words from a reading selection on the board. Students pick two words and tell how they might be connected in a story. Multiple responses should be encouraged.
Semantic Relationships

Schemata are defined not only by their contents, but by what they exclude. Words which have related meanings in one context may seem to be entirely unrelated in others. Beck and McKeown (1983) created semantically related word lists including people, eating, and how we move our legs. For the list about people they created the questions below (p. 624). Unless the two words were mutually exclusive, the students would conclude that the two terms could refer to the same person.

1. Could a virtuoso be a rival?
2. Could a philanthropist be a miser?

This method could be expanded by having the students generate lists of related words first. (See A Cluster Approach in this handbook.) They could list foods, modes of transportation, clothing, and careers, for example, then create questions revealing the relationships among and between the words on their lists.

1. Would you serve hot dogs at a banquet?
2. Does a barge travel across mountains?

3. When would you wear a mackinaw in the desert?

4. Can an architect design a playground?
Generating New Contexts

Deep level processing occurs when students use new words they study in new ways. Whether the vocabulary is employed in written or spoken contexts, the students' learning experience is enriched. The students combine the new knowledge with what they already know and synthesize the two into a new product. Oral discussion allows students to hear many examples of correct usage of new terms in context.

Teachers in a vocabulary development program developed by Beck and McKeown (1983) introduced words about people by providing several actions which the people would do. For example, an accomplice might drive a get-away car and hide his partners. Such contextually rich definitions help students develop schemata related to new words. Once the new words had been introduced in this manner students were asked to tell another thing that an accomplice might do. This activity could be expanded to ask students to name actions which the person would not do.

Open-ended questions were posed for other words. "Tell something you would like to eavesdrop on...Describe the most melodious sound you can think
of" (p. 624). This method encourages students to relate new vocabulary to their own lives, making rich associations for the new information.

The effectiveness of quality discussions cannot be overemphasized. (See the Discussion Methods section of this handbook.)
Introduction

A major aim of education is that students will take command of their own learning. Teachers need to assist students as they gain power over the learning process by teaching them strategies that apply to many learning situations. Readers need to be aware when they lose meaning during reading due to lack of knowledge of word/s in the passage. When context is insufficient to supply meaning, students need to employ other strategies to determine meaning.

Self-selection of vocabulary to study gives students a sense of power over the learning process. Teachers need not create vocabulary lists with weekly tests when students are actively pursuing new words to learn. Teachers can foster this positive learning attitude through sponsoring word collection programs, through modeling of their own learning, and by maintaining a print-rich environment in the classroom.
Silent Sustained Reading

Vocabulary is gained in a cumulative manner, through a long-term process. Nagy (1987) found that the "sheer volume of exposure to the language may be the single most important factor accounting for differences in the contribution of learning from context to vocabulary growth" (p. 240). Since students must master thousands of words per year, and there simply is not sufficient time to directly teach each one, Nagy recommends an SSR program be part of each classroom's daily routine.

SSR programs may be run in a variety of ways. A basic requirement is that the reading material be chosen by the student. A silent reading period should be held each day, for fifteen minutes or more. Following reading students may engage in short discussions about the reading they've done or record their reading in a reading log; however, a tedious assignment that makes students regret having read at all will obviously defeat the purpose of the SSR.

Programs which encourage a large volume of reading at home will also provide students with more opportunities to encounter new words in context. "Book It," sponsored by Pizza Hut Inc., is one such
program. Students who read an appropriate number of books in a month receive a ticket for a free pizza. School-wide reading programs such as Read-a-thons and Reading Olympics, or B.E.A.R. (Be Enthusiastic About Reading) will also encourage a greater volume of student reading.
Capsule Vocabulary

A modified approach to self-selected vocabulary is the Capsule Vocabulary approach developed by Crist (1975). In this case the students list topics which they like to discuss with friends, and about which they would like to have a better vocabulary so as to sound more knowledgeable in conversations. The teacher, using his/her assessment of the students' verbal abilities, makes a list of eight to twelve words about the topic. The words should be on the threshold of the group's recognition—words they have perhaps seen or heard but have been reluctant to try (p. 148).

At the beginning of a class session the teacher introduces, defines, and models the use of each word. The students write the words and meanings for their own reference. During the next part of the lesson the students hold a sample conversation about the topic, using the new words at least once. In the final step students write a short story about the topic, again using the new words.

The effect of choosing a topic results in a positive affective response to the lesson. As
students establish oral command of more words they gain confidence in their oral expression.

Listed below are words prepared for students in a fifth grade class for topics the students listed.

<table>
<thead>
<tr>
<th>Music</th>
<th>Food</th>
</tr>
</thead>
<tbody>
<tr>
<td>bass</td>
<td>a la carte</td>
</tr>
<tr>
<td>classical</td>
<td>buffet</td>
</tr>
<tr>
<td>rhythm</td>
<td>gourmet</td>
</tr>
<tr>
<td>melody</td>
<td>aroma</td>
</tr>
<tr>
<td>chorus</td>
<td>spices</td>
</tr>
<tr>
<td>tone</td>
<td>courses</td>
</tr>
<tr>
<td>harmony</td>
<td>appetizer</td>
</tr>
<tr>
<td>orchestra</td>
<td>natural</td>
</tr>
<tr>
<td>round</td>
<td>banquet</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sports</th>
<th>Friendship</th>
</tr>
</thead>
<tbody>
<tr>
<td>tournament</td>
<td>loyalty</td>
</tr>
<tr>
<td>competitors</td>
<td>amicable</td>
</tr>
<tr>
<td>rivals</td>
<td>confide</td>
</tr>
<tr>
<td>sportsmanship</td>
<td>ally</td>
</tr>
<tr>
<td>athletics</td>
<td>sympathetic</td>
</tr>
<tr>
<td>triumphant</td>
<td>fondness</td>
</tr>
<tr>
<td>victorious</td>
<td>faithful</td>
</tr>
<tr>
<td>vanquished</td>
<td>supportive</td>
</tr>
<tr>
<td>dominate</td>
<td>companion</td>
</tr>
</tbody>
</table>
Word Wizards

This motivational vocabulary program designed by Beck and McKeown (1983) encourages students to find examples of real-world usage of words studied in class. Students contributed examples of the use of the target words in advertisements, newspapers, TV or radio broadcasts, conversations, books, and cases in which they employed the word themselves. The students' contributions were placed on a classroom bulletin board, and students won points for documenting the usage of each word. This program encouraged students to encounter words more frequently and in a greater variety of contexts than they would find them in school texts alone.

Teachers who implemented the Word Wizards program noticed their students using the target words outside of class. In some instances, the results were humorous. For example, the "children would occasionally cause a minor disruption...at an assembly when a speaker used one of the taught words and the entire class would buzz with recognition (p. 625).

As a variation of this program, students could be encouraged to work in groups or teams to collect
examples for the bulletin board, or classroom competitions could be held for a period of time. Individual collections in notebooks would create a profitable long-term implementation of Word Wizards for students who enjoy maintaining such collections.
Etymology

The level of interest students achieve in learning new words can be enhanced through personalizing the word study. One high-interest activity is investigating the meaning of one's own name. Richek (1988) assigned her students to research the meanings of their names. Then they branched out to investigate the history of the names of automobiles, inventions, place names, and food words. Not only did students encounter many interesting examples of word meanings and word histories, but they were encouraged to pursue the study of words as a pleasurable activity. Dictionary and reference materials were used purposefully.

Other categories students might like to study include sports terms, the names of the days of the week or months of the year, and holiday names.
Vocabulary Self-Selection Strategy

Developing a positive attitude toward vocabulary acquisition is the purpose of this strategy developed by Haggard (1986). Each student and the teacher selects and introduces a word to the class that he/she thinks the class should know. The teacher records the word list on the blackboard. After the list is complete the class chooses which new words to study for the week.

A variation of this strategy allows each student to select his/her own list; or the group could select common words for part of the list while each student chose the remainder of his/her personal list to study.
This activity is similar to the Vocabulary Self-Selection Strategy insofar as each member of the class chooses a word to present to the group. In Spoken Words, developed by Grubaugh (1985), however, the student introduces his/her word through a story or anecdote about or containing the target word. The remainder of the class records the new word and a short summary of the story or anecdote in a vocabulary notebook. Once each student has presented a required number of words s/he takes a test on the list. The student first completes a set of directions as follows and then writes an original sentence using the target word.

Test Questions (p. 66):

1. write a definition
2. write a synonym
3. provide an associative word
or
4. write "no response"
Vocabulary Scavenger Hunt

This strategy, presented by Vaughn, Crawley and Mountain (1979), provides students with another way to contribute words to the class. At the beginning of a unit of study the teacher prepares a chart like the following which students first complete independently prior to reconciling their responses with a group (p. 66):

<table>
<thead>
<tr>
<th>Land Vehicles</th>
<th>Water Vehicles</th>
<th>Air Vehicles</th>
</tr>
</thead>
<tbody>
<tr>
<td>jeep</td>
<td>plane</td>
<td>kayak</td>
</tr>
<tr>
<td>jet</td>
<td>barge</td>
<td>rocket</td>
</tr>
<tr>
<td>taxi</td>
<td>hearse</td>
<td>blimp</td>
</tr>
<tr>
<td>canoe</td>
<td>sloop</td>
<td>tanker</td>
</tr>
<tr>
<td>yacht</td>
<td>glider</td>
<td>trolley</td>
</tr>
<tr>
<td></td>
<td></td>
<td>convertible</td>
</tr>
<tr>
<td></td>
<td></td>
<td>carriage</td>
</tr>
</tbody>
</table>

Once the group has completed the chart, each person brings pictures, drawings, or tracings of the listed items to gain points for his/her team. The team with the most illustrations wins.
As a variation of the activity, students could contribute appropriate items which were not listed by the teacher and receive extra points.

In another variation the teacher could provide the chart and teams could try to find as many examples as possible in a given time. For example, a unit on simple machines would lend itself well to this purpose. Students could compete to find instances of the application of the various simple machines in their homes, and around the school or neighborhood.

<table>
<thead>
<tr>
<th>Lever</th>
<th>Pulley</th>
<th>Screw</th>
<th>Wheel &amp; Axle</th>
<th>Inclined Plane</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Knowledge Rating

Raising the students' level of awareness about word knowledge benefits them as they develop metacognitive strategies in reading. Metacognitive strategies help students monitor their own comprehension as they read. When students come to a passage which they do not comprehend because there are unfamiliar words, they can use other strategies to determine word meaning. Students need to be aware of the extent of their developing vocabularies.

When the teacher introduces vocabulary prior to reading a selection it is a good time to ask students to rate their knowledge of the target vocabulary. That gives the teacher an idea of the students' knowledge and alerts students to gaps in their vocabularies.

Most often students believe that they either do or do not "know" a word, without realizing that there are many levels of knowing. The scale designed by Blachowicz (1986) is very simple, having just three parts:

Can define          Have seen/heard                Don't know

A more sophisticated scale would require students to make a finer determination of their level of word knowledge, as well as raise their awareness of the various stages of meaning acquisition.

1. I've never heard or seen the word.
2. I think I've heard or seen the word before.
3. I know I've heard or seen the word, but I don't know what it means.
4. I know what the word means if it is used in a sentence.
5. I can use the word in a sentence, but I can't explain what it means.
6. I can tell what the word means and I can use it in a sentence.
7. I know more than one meaning for the word and I can use all of them in sentences.
Graphic Organizers

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Introduction

Graphic organizers were originally developed to assist students with mastering a large number of concepts related to a unit of study in a content area. There are many ways to design a graphic organizer; the choice depends on the purpose of a lesson. Horton, Lovitt and Bergerud (1990) describe the basic requirement of a graphic organizer. "The unifying element underlying the various graphic terms is the visuospatial arrangement of information containing words or statements that are connected graphically to form a meaningful diagram" (p. 12).

Graphic organizers include semantic webs, maps and networks, flow charts, structured overviews, tree diagrams, and charts and tables. The simplest form is a visual outline of chapter headings which the teacher presents to students prior to reading the chapter in order to give the students an overview of the content of the chapter. More complex graphic organizers can chart the plot of a story or show the flow of energy through a food web. Students should learn to design their own graphic organizers as a personal study method.
Structured Overview

The structured overview is a pre-reading activity which helps students preview the content of a chapter or passage they will read. The teacher designs and presents the structured overview to the students. The ideas are hierarchically arranged as shown in this diagram by Vacca (1981, p. 62):
Below is a structured overview of a unit on forecasting weather for the fifth grade.

Weather Patterns

Measuring Weather
- Wind
  - Wind vane
  - Anemometer
  - Wind sock
- Air pressure
  - Barometer
- Precipitation
  - Rain gauge

Observing Weather
- Weather stations
- Weather satellites
  - Weather balloons
  - Radar
  - Buoys
  - Cloud cover
  - Major storms
A structured overview designed by Dupuis and Snyder (1983, p. 301) for a science unit on "The Biosphere and its Inhabitants" follows:
Concept Ladder

When a "teacher would like students to focus on a single word that represents the main concept of a selection rather than on a set of words," Blachowicz (1986, p. 646) recommends use of the Concept Ladder which requires an in-depth description of the target word. Students bring their prior knowledge to bear as they relate the new term to their own experiences. By completing the Concept Ladder before reading the students will discover what they do not know about the target word, and thus have their attention drawn to new information about the target word which is contained in the reading selection. Blachowicz's example describes the guitar (p. 648).

Kind of? Instrument
Part of? a band
Made of? wood, metal, plastic
GUITAR
Kinds of? folk, classical, electric
Part(s) of? strings, ?
Made (used) for? making music
Hierarchical Arrays

Nagy (1988) reported that a group of related terms which falls into a taxonomic relationship is well displayed in a Hierarchical Array. Although it is often used for terms in biology, it has other applications as well, as Nagy demonstrated in this Hierarchical Array (p. 30):

```
Hierarchical Array Diagram

- Shelters
  - Permanent
    - people
    - animals
    - storage
      - tent
      - barn
      - shed
      - warehouse
  - Temporary
    - small/decrepit
    - house
    - shanty

- large
- fancy
- palace
- mansion
```
Verbal Seriation

(Linear Displays)

When the relationship among a group of words is a matter of degree, as in a series of adjectives, Koeller (1981) recommends use of the Verbal Seriation display. The teacher should elicit a group of adjectives from the class and list them on the board. Next the class discusses the placement of the adjectives along a line of polarity from the least to the greatest, from the weakest to the strongest, from the first to the last, from the oldest to the newest, from the closest to the furthest, and so forth. In a series of adjectives describing foods, a group of sixth graders made this Verbal Seriation from the most tempting to the least likely to be eaten:

scrumptious

| delicious |
| tasty |
| appetizing |
| disgusting |
| rotten |
| yucky |
| gross |
Classification Table

When students encounter a large number of names of historical figures, place names, and new terms in social studies texts, they can be confused not only by the large number of new words, but by the relationships among them. A Classification Table is recommended by Simpson (1987) to organize the information into categories which reveal the relationships. The table below is based on a unit of study of the American Colonial Era.

<table>
<thead>
<tr>
<th>New England Colonies</th>
<th>Middle Colonies</th>
<th>Southern Colonies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mayflower Compact</td>
<td>William Penn</td>
<td>Indentured servants</td>
</tr>
<tr>
<td>New Amsterdam</td>
<td>slavery</td>
<td>House of Burgesses</td>
</tr>
<tr>
<td>Jamestown</td>
<td>Quakers</td>
<td>plantations</td>
</tr>
<tr>
<td>Lord Baltimore</td>
<td>apprentice</td>
<td>London Company</td>
</tr>
<tr>
<td>Middle Passage</td>
<td>Paul Revere</td>
<td>James Oglethorpe</td>
</tr>
</tbody>
</table>
**Semantic Feature Analysis**

Another way to reveal the relationships among the words in a large related group of words is the Semantic Feature Analysis. The target words are listed along one side of the matrix and the related features along the other. Each word is marked with a "+" or "-" sign to show whether it has the feature or not. The Semantic Feature Analysis chart below was developed by a group of fourth grade students during a study of the solar system.

<table>
<thead>
<tr>
<th></th>
<th>rocky</th>
<th>gaseous</th>
<th>moons</th>
<th>rings</th>
<th>atmosphere</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mercury</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Venus</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>Earth</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>Mars</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>Jupiter</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Saturn</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Uranus</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Neptune</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Pluto</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
SAVOR, Subject Area Vocabulary Reinforcement, is similar to the Semantic Feature Analysis. It is designed to be completed by the students after reading a selection or completing a unit of study to reinforce vocabulary.

Stieglitz and Stieglitz (1981) advised teachers to help students learn the process with a familiar topic before applying it to a new area of study. For example, students could complete a chart about monsters based on their own knowledge (p. 47).

<table>
<thead>
<tr>
<th></th>
<th>Big</th>
<th>Hairy</th>
<th>Strong</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>King Kong</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Hulk</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>Dracula</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>Cookie</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Monster</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Godzilla</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
</tbody>
</table>
Once students understand the process, they are ready to study a unit and create a chart based on the unit content. A chart about growing fruits such as the following could be part of a student’s report for science (p. 47):

<table>
<thead>
<tr>
<th></th>
<th>Grown in temperate climate</th>
<th>Tart tasting</th>
<th>Tree grown</th>
<th>Grows in bunch</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apple</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>Banana</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Lemon</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>Grapes</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>Melons</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Persimmon</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>Kumquat</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>-</td>
</tr>
</tbody>
</table>
A Semantic Map is a free-form graphic organizer in which each student or group, or the class as a whole, creates the form depending on the nature of its contents. Semantic Maps can show relationships among parts of a story, chapter, or unit of study, sub-groups of words related to a general concept, or a variety of terms related in one way or another.

Stahl and Vancil (1986) reported that "the vocabulary discussion is the key element in the effectiveness of semantic mapping" (p. 62). In a comparison of treatment groups, those who experienced the in-depth discussion treatment retained the new vocabulary best. The active involvement of students in the discussion group caused deeper processing of the new information, and greater opportunities to relate the new words to background knowledge. (Also see the Discussion Methods section of this handbook.)

The following Semantic Map contains vocabulary terms studied in a unit about the California Gold Rush.
maps

gold nuggets

pyrite (Fool's gold)

placer gold

Finding Gold

Gold in California

Going to California

Forty-niners

Isthmus of Panama

overland

wagon train

Mining for Gold

panning

sluice box

cradle

gold field
Venn Diagram

The Venn Diagram is a means of demonstrating which items from two larger groups can combine into a common third group. The following Venn Diagram was constructed by students who had read Chapter XIII in Charlotte's Web by E. B. White. In the chapter Templeton, the rat, goes to the Zuckermans' dump to try to find a word for Charlotte to weave into her web. In the Venn Diagram the students listed which items would be found in the Zuckermans' dump in one circle, and what their families send to the dump in the second circle. In the overlapping portion of the two circles are the common items which could be found at the Zuckermans' dump and which are also discarded by the students' families.
Venn Diagram for

Zuckermans' Dump & Our Trash

overalls
spikes
stoppers
broken hinges
broken springs
dishmops
leaky pails
ice-cream
freezer crank
tin cans
dirty rags
metal
bottles
batteries
magazines
Junk

broken dishes
soda cans
cereal boxes
used Kleenex
used Pampers
broken toys
newspapers
plastic bottles
Contextual Strategies

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A major goal of vocabulary instruction is to provide students with strategies to determine word meaning when they read independently. Nagy (1988) demonstrated that students learn a majority of new words from wide reading. (See Silent Sustained Reading in this handbook.)

Stahl (1983) described two types of knowledge students need to have about vocabulary words: definitional knowledge and contextual knowledge. He wrote, "Definitional knowledge can be defined as the knowledge of the relations of a word to other known words...Contextual knowledge is defined as the knowledge of a core concept and how that concept is realized in different contexts" (p. 4). Stahl advised teachers to use mixed methods of instruction so their students will have more strategies available to them as they read independently.

The use of contextual strategies enables students to independently discover word meaning in context through first determining the meaning of the surrounding context. The students learn to examine contexts through direct practice and through writing or generating contexts for known words. Students
apply critical thinking skills as they comprehend or create a text. Students access their existing schemata as they apply contextual strategies to new contexts.
Context Clues

Readers employ three cuing systems to get meaning as they read. The grapho-phonic, syntactic and semantic systems each lend assistance to the reader as s/he decodes the printed form, expects language to follow familiar patterns, and understands the words which make up the text. There are a number of semantic clues which students can learn to observe in reading. Crawley and Mountain (1988) described eight such clues as follows (p. 75-76):

1. Direct definitions or explanations in the text
   Sauerkraut is a food made from fermented cabbage.

2. Explanation through example
   Mr. Jones has arthritis; the joints of his fingers are swollen and painful.

3. Words in a series clue
   There were kalanchoes, temple bells, geraniums, azaleas, and African violets on display.

4. Synonym or restatement clue
   The velocity, or speed, of the projectile was 15 kilometers per minute.
5. Comparison or contrast clue
   Alva was very *diffident* while Bobby was an extrovert.

6. Familiar expressions or figures of speech
   There is no doubt that our guest was *somnolent*. Francis slept like a log.

7. Inference clue
   The monk looked as though he were going to *macerate* after his long period of excessive fasting.

8. Mood or tone clue
   The carnival noises filled the air with sounds of joy, happiness and excitement. The evening was *felicitous*.

Teachers should provide their students with practice on examples such as those given above. When such clues are contained in a classroom reading selection the teacher should call the students' attention to them so the students will be prepared to recognize such clues when they read independently.
Context Clues in Content Texts

Vacca (1981) discussed the use of context clues in content area texts. These books are often written and edited to contain such reader aids. He explained that students need to learn to use context clues because contextual analysis is "mostly a matter of inference. Inference requires readers to see an explicit or implicit relationship between the unfamiliar word and its context or to connect what they know already with the unknown term. It can't be assumed that students will perceive these relationships or make the connections on their own." (p. 71-72).

Since content area texts often contain context clues, teachers should assist students in locating and examining instances of their use in the classroom texts. The teacher's aim is to develop independent use of these strategies.

The context clues identified by Vacca are as follows (p. 73-74):

1. Definition The author provides a simple definition in the text.
2. Linked synonyms  The author gives a synonym in the text.

3. Direct description  The author provides appositives, phrases, clauses with additional information.

4. Contrast  The author contrasts a word with its opposite.

5. Cause-Effect  The author gives a cause-effect relationship which explains the meaning of a word.

6. Mood and tone  The author's mood or tone gives a clue to a word's meaning.
Computer Programs

Computer programs which simulate a situation require students to use new vocabulary in a realistic context. Such simulation programs are often in a game format which increase student interest greatly. A wide variety of such programs are available for most areas of the curriculum.

"Oregon Trail" by MECC simulates a trip by wagon train to Oregon. The player is responsible to purchase adequate supplies for the trip, to make decisions about routes to take and advice to follow. "Marketplace," also by MECC, teaches students about profits and losses in various businesses. "Mathshop" and "Mathshop, Jr." are available from Scholastic; in both versions math terms are visually represented as students enter various shops in a mall.

Programs available through CUE (Computer Using Educators) include "Annie's Mission" in which a young girl explores a California Mission. The program includes a dictionary which gives the English translations of Spanish names for the parts of the mission. "Trek of the Forty-Niners" takes the students through a gold rush town on their way to the gold fields. The students enter a saloon, livery
stables, general store, and other shops to gather supplies and clues before they go to the gold fields.

Numerous other simulations are available in all areas of the curricula.
Prediction Strategies

Readers make a series of predictions as they read based on their own background knowledge and the content of the text they are reading. Their predictions are constantly confirmed or revised during reading, and new predictions are made. This is part of the metacognitive nature of reading in which readers monitor their comprehension during reading. Students can learn several strategies to help them strengthen their use of predictions as they read.

Content area texts are purposely written with chapter headings and subheadings which in themselves provide an outline of the chapter's contents. Predictions can be made based on a preview of the chapter's contents. To demonstrate the process, the teacher prepares a structured overview or a hierarchical array (See the Graphic Organizers section of this handbook.) using the title, headings and subheadings from a chapter. Then s/he asks the students to predict what the chapter is about. This discussion helps students activate their background knowledge and make initial predictions about what
they will read. Students then read the chapter and confirm or revise their predictions.

Multiple meaning words can be confusing to students who do not know the meaning of a target word in a specific context. Teachers should preview reading assignments and select such words to alert students to their presence in the selection. Ask students to predict how the words could be used in the passage and record their predictions. After reading the selection students compare their predictions with the meaning the words actually had in the context of the selection. When students find a discrepancy between their prediction and the actual meaning in the text, their schema for the word is restructured to accommodate the new knowledge.
Predict-o-gram

This strategy, developed by Blachowicz (1986), is designed for use with narrative reading. It helps students associate target vocabulary words with the parts of a story where they would be used. The teacher introduces the words and asks the students to predict whether the words might refer to the action, characters, or other components of the story. The students list each word in each category that it might reasonably be expected to appear, and discuss the reasons for their predictions. After reading the story the students re-examine their predictions. A sample predict-o-gram based on "The Greyling" by Yolen follows (p. 648):

The setting: rolling seas townsfolk

The characters: fisherman townsfolk

The goal or problem: rolling seas stranded

The actions: stranded

The resolution: wail grief

Other things: selchie
Story-Impressions

This method was developed by Denner (1986) to help students develop better reading comprehension of narrative form. First the teacher identifies the key words or phrases from the story which convey an impression of what occurs in the story. S/he lists them on the board with arrows showing the direction of the story. The students compose a group story using the impressions in the order listed, and the teacher records their story on an overhead or the board. After creating their story the students read the selection. A post-reading discussion is held to compare the actual story with the predicted story. The students compare how the story impressions were used in the author's story with how they were used in their story.

In a variation of this method, students can write individual stories from the list of words and phrases.
Art, Music & Drama Methods

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Introduction

Students' vocabularies grow with each exposure to new terms and each encounter with familiar words in new contexts. They need a variety of language experiences to strengthen their associations with the vocabulary in the curriculum. The arts enable students to experience learning in different ways, whether visually, auditorially, or physically, than in traditional lessons. By integrating art, music and drama experiences with the curriculum teachers will enhance their students' vocabulary acquisition.

The activities contained in this section are designed to extend and enhance vocabulary instruction. The arts are inherently interesting and help motivate students' academic success.
Cartoons & Comics

Students can collect cartoons and comics that demonstrate interesting examples of language usage. Goldstein's (1986) students collected examples of puns, figurative language, and colloquial expressions. The students kept notebooks of their collections and challenged each other to find the most difficult words used in cartoons and comics. Students also contributed examples to the classroom bulletin board.

Demetrullas (1982) extended the use of comic strips by snipping out the dialog from the speech bubbles, duplicating the strips, and having the students write original dialogues using vocabulary words under study.

When students design and draw their own cartoons and comics they process language in another form of expression, strengthening their understanding of the concepts involved. Using a list of target words in a cartoon or comic provides the student with another opportunity to explore the relationships among and between the words.

Cartoons and comics lend themselves readily to expressing arithmetic problems. Students must visualize the meaning of such math vocabulary as
"greater than", "perpendicular," or "similar" to produce a meaningful drawing. By converting arithmetic word problems into drawings students combine the language of math with the language of art.

Teachers can design cartoons and comics to help make difficult concepts clear. The use of the target vocabulary is demonstrated in a visual context, giving students another avenue of learning new terms and proper usage. The following example comes from a fourth grade unit on dental hygiene.
TOMMY TOOTH WAS A HAPPY, HEALTHY TOOTH UNTIL...

BACTERIA STUCK TOGETHER AND COVERED HIM WITH PLAQUE.

SUGAR FROM FOOD COMBINED WITH THE PLAQUE TO MAKE ACID. TOMMY GOT A CAVITY. HE FELT VERY BAD.

THE DENTIST FILLED TOMMY'S CAVITY AND TOLD HIM TO BRUSH AND FLOSS EVERY DAY.
Illustrating a Description

Long descriptive passages lend themselves to an artistic interpretation. When a story or chapter contains such a passage it may be effectively read aloud by the teacher as students visualize the scene. Having heard the passage, the students can then draw what they have visualized. Chapter VI "Summer Days" in Charlotte's Web by E. B. White is a descriptive passage which suits this method well. Some of the parts of the description which could be contained in the students' illustrations are:

- lilacs
- apple blossoms
- trout
- bees
- work horses
- mowing machine
- hay wagon
- loft
- barn
- swamp
- fields
- sparrow
- swallows
- dandelions
- green worm
Skits & Plays

Drama activities provide students with immediate language experiences using the four language modalities of listening, speaking, reading, and writing. Pre-written scripts are useful, but students gain greater command of language when they write their own skits and plays.

Very simple skits may require no written script. Reuse (1977) required her students to act out short skits using target vocabulary words in such a way that their meaning would be clear. "One girl CONJURED up out of the wastebasket a genie with a PROTUBERANT nose; another completely ENSCONCED her best friend in a roll of leftover Christmas wrap which she then EMBELLISHED with leftover bows" (p. 59).

Duffelmeyer and Duffelmeyer (1979) wrote, "One other advantage to using dramatizations is that they give opportunity for a discussion of speech levels and the use of words in specific social contexts, such as speech versus writing, or casual conversation versus formal situations" (p. 143). Classroom discussion plays a large part in direct experiences as students hear and see the teacher and fellow
students demonstrate proper usage of new vocabulary words. (See the Discussion Methods section of this handbook.)

Enacting arithmetic word problems is an effective way to illustrate the meaning of many confusing math terms. The abstract nature of mathematics makes careful study of its special vocabulary especially critical. As students dramatize such concepts as "diagonal," "surface area," or "difference," their schemata are expanded and their vocabulary connections strengthened.

Minor variations in meanings of closely related verbs can be demonstrated through pantomimes. Beck & McKeown (1983) related how students pantomimed the movement for words such as "galumph, trudge, or meander" (p. 623) when the teacher read aloud a story containing a variety of such verbs. This same approach can be used to demonstrate how characters speak in various ways such as declare, deny, exclaim, pronounce, murmur, confide, and remark.

Pantomimes are a kinesthetic means of learning new words which enables students to associate motor movement with word meaning. Casale and Manzo (1982) explained the process of the proprioceptive approach. First the teacher introduces and explains the meaning
of a new word. The students create pantomimes demonstrating the word's meaning, and everyone in the group acts out the pantomimes while the teacher repeats the word and its meaning or a known synonym. Then the students read the selection containing the target words. A discussion including reference to the use of the target words in the passage follows reading.

Drama can be incorporated in other ways as well. Students can retell a story through a skit, and a unit in social studies can be dramatized as students act out an historical event. The more encounters students have with the new vocabulary they meet, the stronger will be their associations with the new terms.
Readers Theatre

Readers Theatre is a form of drama which develops from a reading selection. After students have read and discussed a story, chapter or scene from a longer book, or an expository text, they can rewrite a scene in Readers Theatre script form. The process provides students with multiple encounters with the text as they read, re-read, discuss, write and re-write the text in script form, practice and finally perform the script.

To prepare a Readers Theatre script, first select a text composed primarily of dialogue. Assign lines of text to characters contained in or suggested by the text, and rewrite the prose into script form. In Readers Theatre the characters are seated in an appropriate arrangement on the stage, but there is little if any movement on the stage. The emphasis is on the interpretive reading of the script, not on dramatic actions.

Teachers should introduce Readers Theatre with a prepared script first, then teach the students how to adapt their own scripts from classroom reading materials. The basal reader stories are readily adapted to Readers Theatre scripts since they contain a high percentage of dialogue.
The following example of a Readers Theatre script adapted from *Digging Up Dinosaurs* by Aliki shows how a script can be created from an expository text. The book is written throughout in the first person as a girl tells about visiting a museum where she sees dinosaur skeletons on display. In this Readers Theatre adaptation the dinosaurs are made to speak for themselves as characters.
DISSING UP DINOSAURS

By Aliki

Adapted for Readers Theatre by Patricia L. Paige

Readers: Narrator, Apatosaurus, Corythosaurus, Iguanodon, Triceratops, Scolosaurus, Tyrannosaurus Rex

Narrator: Have you ever seen dinosaur skeletons in a museum? I have. I visit them all the time. I went again yesterday. I saw Apatosaurus.

Apatosaurus: I weighed 70,000 pounds and ate plants. I was once known as Brontosaurus.

Narrator: I saw Corythosaurus.

Corythosaurus: I was a duck-billed plant eater. I had a crest on top of my head.

Narrator: I saw Iguanodon...

Iguanodon: I was a plant eater, too. I had horns that looked like thumbs.

Narrator: ...and Triceratops.

Triceratops: I had three horns on my head and I also ate plants.
Narrator: I like to say their names. Scolosaurus was just where I had left it.

Scolosaurus: I was an armored dinosaur and a plant eater.

Narrator: And Tyrannosaurus Rex looked as fierce as ever. Tyrannosaurus used to scare me. I still can’t believe how big it is. Just its head is almost twice my size.

Tyrannosaurus: I’m known as the king of the dinosaurs because I was a big meat eater.

Narrator: I’m not afraid of dinosaurs anymore. Sometimes I call them "you bag of bones" under my breath. I can spend hours looking at them. I used to wonder where they came from and how they got into the museum. But now I know.

Scolosaurus: We lived millions of years ago. Some of us were as small as birds.

Apatosaurus: ...but most were enormous.

Iguanodon: Some dinosaurs ate plants.

Tyrannosaurus: Some dinosaurs ate the meat of other dinosaurs.
Corythosaurus: And some may have eaten the eggs of other dinosaurs.

Narrator: Dinosaurs lived almost everywhere on Earth. They lived for millions of years. Then they died out. No one is sure why they became extinct, but they did. There hasn't been a dinosaur around for 65 million years.

Triceratops: Until about 200 years ago, people did not know anything about dinosaurs. Then people began finding things in rocks.

Apatosaurus: They found large footprints.

Scolosaurus: They found huge, mysterious bones and strange teeth.

Iguanodon: People were finding fossils.

Narrator: What are fossils?

Tyrannosaurus: Fossils are a kind of diary of the past. They are the remains of plants and animals that died long ago.

Corythosaurus: Instead of rotting or crumbling away, the remains were preserved, and slowly turned to stone.
Apatosaurus: When I died 80 million years ago I sank into a river. After my flesh rotted away my skeleton was covered by mud. The mud and my skeleton turned to stone. I was hidden for millions of years. Then the earth changed and some stone broke away. About 100 years ago some people found me.

Iguanodon: Fossil hunters found more and more big bones in different parts of the world.

Triceratops: Scientists studied the fossils.

Apatosaurus: They said the bones and teeth and footprints all belonged to a group of giant reptiles that lived on Earth for millions of years.

Scolosaurus: We were named Dinosauria, or terrible lizards.

All Dinosaurs: That's us!

Narrator: I bet people crowded into museums to see you. But I know you didn't just get up and walk there!

Tyrannosaurus: We were dug out of the ground, slowly and patiently.
Iguanodon: This is how they find us. Fossil hunters search along riverbanks and in quarries. They climb up high cliffs and down into steep canyons.

Corythosaurus: They get lucky when someone spots a fossil bone poking through the rock.

Apatosaurus: They cover the site with a tent, and the work begins. I was buried so deep, the rock around me had to be drilled and blasted away.

Tyrannosaurus: Tons of rubble were carried away from me.

Iguanodon: Scientists chipped the rock close to my bones. They brushed away the grit. They were very careful.

Scolosaurus: As soon as my bones were uncovered, they were brushed with shellac. The shellac helped hold my bones together, so they wouldn’t crumble. Then they put numbers on each bone.

Corythosaurus: That way, there can be no mix-up later when someone tries to put your skeleton together.
Iguanodon: A draftsman drew each of my bones in its exact position, and the photographer took pictures.

Apatosaurus: When your bones are ready to be moved, people wrap them carefully.

Scolosaurus: My small bones were wrapped in tissue paper and put into boxes or sacks.

Tyrannosaurus: My large bones were left half buried in the rock. They were covered with a plaster cast, just as a broken leg is. They were dug out later, in the museum.

Apatosaurus: All my bones were packed in straw, put in a crate, and taken to the museum.

Iguanodon: At the museum scientists unwrap all your bones.

Tyrannosaurus: They finish digging them out of the rock.

Corythosaurus: They study your bones to see how old you are and what kind of dinosaur you were.

Scolosaurus: They compared my bones to other dinosaurs and even to other kinds of animals. They figured out what size and shape I was.
Iguanodon: They figured out how I stood and walked, and what I ate.

Triceratops: If they find all your bones they can build your complete skeleton.

Apatosaurus: They made a frame shaped liked me to support my bones. Then they wired my bones together, one by one. My bones were held together with pieces of metal.

Scolosaurus: Some of my small bones were missing, so scientists made replacements with plastic or fiberglass. You can hardly tell my old bones from my new ones.

Tyrannosaurus: After many months the scientists were done. My skeleton looked just as it once did.

Narrator: Until recently, only a few museums had dinosaurs. Then scientists learned how to make copies of the skeletons.

Iguanodon: We’re hard to copy. It takes a long time.

Apatosaurus: First they take your original skeleton apart, bone by bone.
Triceratops: Then they make a mold for each bone and make new pieces out of fiberglass.

Narrator: A fiberglass dinosaur is just as scary as the original, but much stronger and lighter. Now museums all over the world have dinosaur skeletons. And many people can spend hours looking at them, the way I do.
Music

Music has a natural appeal to everyone. Song lyrics provide teachers with an enjoyable way to present new vocabulary to their students. Teachers should select songs which suit a current unit of study to strengthen association of meaning.

Students can write original lyrics to familiar tunes using vocabulary from a unit of study. This example accompanies a fourth grade unit on geology.

Mary had a Little Rock

Mary had a little rock, little rock, little rock,
Mary had a little rock that she found in her yard.

She took it to her school one day, school one day,
school one day,
She took it to her school one day, to share at show and tell.

She said that it was igneous, igneous, igneous,
She said that it was igneous, and John asked what that meant.

Mary told him igneous, igneous, igneous,
Mary told him igneous comes from a volcano.
Magma is a molten rock, molten rock, molten rock.
Magma is a molten rock deep below the ground.

When magma cools underground, underground, underground,
When magma cools underground, it hardens into granite.

When magma comes out volcanoes, volcanoes, volcanoes,
When magma comes out volcanoes, its name is changed to lava.

The lava runs across the land, across the land, across the land,
The lava runs across the land, and hardens as it cools.

Smooth lava rocks are obsidian, obsidian, obsidian,
Smooth lava rocks are obsidian, they look like blackened glass.

When lava cools up in the air, up in the air, up in the air,
When lava cools up in the air, it is so light it floats.

The floating rocks are called pumice, called pumice, called pumice,
The floating rocks are called pumice, they're full of air bubbles.

That's all she told of igneous, igneous, igneous,
That's all she told of igneous, but there's even more to know.
Figurative Language

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Introduction

Figurative language is the language of poetry and literature, and it plays a part in everyday conversation as well. From the most obscure idiom to the most elegant metaphor to the silliest pun, figurative language enriches human expression. The methods in this section encourage the students to recognize these special usages and experiment with language as they develop voices of their own.

Students need direct instruction in the various forms of figurative language. Teachers should examine the classroom reading selections for instances of figurative language for study. Classroom libraries should contain riddle and joke books as well as poetry and quality literature. Students can contribute examples of figurative language they have seen in print or heard in the environment.
Figures of Speech

Figures of speech are special forms of language which students must learn to both recognize and use. Crawley and Mountain (1988) reported on research which revealed that students misunderstood figurative language used in their social studies textbook. "For example, the dark horse candidate, Warren Harding, was thought to be the first Black president of the United States" (p. 79). Students need to understand the nature of figurative language which is so common in literature, textbooks, and other daily contexts.

Teachers should point out examples of figures of speech contained in classroom texts and encourage students to contribute examples they find in their reading or environment. Songs and commercials are common sources of figurative language. Student contributions can be collected in a classroom book or used in a bulletin board display.

The most common figures of speech and examples given by Crawley and Mountain follow (p. 79-80):

1. A hyperbole is an exaggeration or overstatement.
   Example: I am so hungry I could eat a horse.
2. Irony is used to express the opposite of its literal meaning. It's humorous, light sarcasm. Example: Your performance was magnificent. You bombed out.

3. A metaphor is an analogy or comparison between two different things, but the words like and as are not used. Example: Philip is a sly fox.

4. Onomatopoeia is the use of words whose sounds suggest their meaning or sense. Example: Hiss went the snake. Bang went the gun.

5. Oxymorons are words which are used together, to describe, but which are opposite in meaning. Example: Stephen Douglas was called a little giant.

6. Personification involves giving a thing or abstraction human qualities. Example: The fox spoke in a soft inviting manner.

7. A simile is a comparison between two different things using the word like or as. Example: A teacher with a hundred students is as busy a beaver.
Analogies

Analogies are a powerful means of comparing the relationship between two sets of concepts. They are usually based on similar, opposite, and part-whole relationships. First one must infer the relationship between two given terms, then identify the word which holds the same relationship to a third word.

Dupuis and Snyder (1983) advised the use of analogies to help students master the vocabulary and relationship between concepts in a unit of study. The following examples come from a study of environmental science (p. 304):

Niche : habitat as house : neighborhood.

Extreme : moderate as high : middle.

Plankton : protists as reptile : amphibian.

Sewage : water as smoke : air.

Ecosystem : forest as government : legislature.
Idioms

Idioms are special expressions which can not be defined literally. Students are exposed to these special sayings in everyday speech and television programs as well as classroom reading texts.

Students should be encouraged to collect examples of idioms from their reading and environment. An interesting way to make clear the special meanings of idioms is through illustration on a poster. The poster has two parts; the first shows a literal, and usually humorous, interpretation of the words, and the second depicts the actual meaning of the expression.

Some idioms that are easily illustrated are:

- caught a cold
- stole the show
- threw the book at him
- eat your words
- hit the sack
- a fork in the road
- on cloud nine
- night falls
- break the news
- in hot water

A sample poster for an idiom follows:
Give me a ring.

Call me on the phone.
Riddles and Puns

The delight children find in riddles and puns helps them learn to appreciate language used in these special ways. Sources for riddles include library books, children's weekly newspapers, children's pages in the daily newspaper, and children's magazines. Hold a week-long contest to collect the most humorous riddles.

Tyson and Mountain (1982) described five types of riddles (p. 171-172):

Homonym riddle:

What does a grizzly bear take on a trip?
Only the bare essentials.

Rhyming-words riddle:

What is a happy parrot?
A jolly polly.

Double-meaning riddle:

How are a king and a book alike?
They both have pages.

Figurative/literal riddle:

Why were the mice afraid to be out in the storm?
Because it was raining cats and dogs.
Intonation riddle:

If everyone in a country drove a pink car, what would the country be called?

A pink car nation.

Mike Thaler (1985, Scholastic), America’s self-proclaimed riddle king, has written a handbook for children, Funny Side Up, in which he describes the steps in creating a riddle. Thaler (1987, Mindscape) also wrote a computer program, "Riddle Magic," which children can use to write and print original riddles.
Writing Activities

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Introduction

Vocabulary acquisition requires several steps. New words are met through listening or reading, which are receptive processes. Repeated encounters with new terms in a variety of contexts enriches the student's schemata for the concepts represented by the words. Speaking and writing are expressive processes in which the student creates a new context for the words s/he has learned.

Simpson (1987) concluded from a review of the literature that there is a hierarchy of four basic operations students much accomplish as they learn new vocabulary. Both oral and written expression demonstrate a student's ability at each step. Simpson's four processes are (p. 22):

1. Students should be able to recognize and generate the critical attributes, examples, and nonexamples of a concept.
2. Students should be able to sense and infer relationships between concepts and their own background information.
3. Students should be able to recognize and apply the concept to a variety of contexts.
4. Students should be able to generate novel contexts for the targeted concept.

Teachers need to provide students with many opportunities to apply their new vocabulary words in self-generated contexts. When students use the words under study in their oral and written expressions the students process the language at a deeper cognitive level which enhances retention.

The activities in this section are designed to expand the students' experiences with new vocabulary in written expression. In some cases students will have the assistance of a structured form of writing, and in other cases they will have more latitude for self-expression. Both forms are important.
Sentence Rewriting

Sentence rewriting is a directed writing activity that can be done in several ways. In its simplest form the students rewrite the sentence using a known synonym or phrase for the target word/s. The students should then read and discuss their sentences to find any differences in meaning.

In a variation of this method Simpson (1987) suggested that the teacher write a sentence in which the meaning of a target word is described and then have the students rewrite the sentence using the new word appropriately. For "initiative" she gave her students the following sentence: "The young politician wanted the common people to have a voice in their government and to decide what bills could be introduced to the state legislature" (p. 25).

A third way to rewrite sentences is to include an appositive phrase defining a word in the sentence. Teachers need to point out examples of appositives which are frequently used in content area textbooks. (See Context Clues in Content Areas in the Contextual Strategies section of this handbook.)
Learning Logs

Learning Logs were created for use in content areas when students are required to master a large body of knowledge. The logs allow students to record what they have learned and examine their own learning process. These log entries can be adapted to emphasize vocabulary learned in a unit as a welcome change from the traditional vocabulary notebook full of stilted definitions.

At the beginning of a unit of study the teacher assigns a log to be maintained daily. Students record a summary of what they have learned using the new vocabulary terms appropriately. The students should explain in their daily entries how they arrived at conclusions, and what they have learned that revises their previous thinking on the topic. They should discuss their predictions for future learning, and ways they will apply what they have learned to current or new situations. Affective responses to their new knowledge should also be addressed.

If desired, the teacher can require that a portion of the daily entry focus especially on new words. Students can record the target words,
definitions based on class discussion, personal associations, examples and nonexamples, and sample sentences containing the target words. (See various methods in the Association Methods section of this handbook.)
Paired Word Sentence Generation

Students experience deeper processing of new learning when they are required to generate new contexts for what they have studied. Simpson (1987) devised a method which requires students to generate a sentence containing two new words. Thus students must demonstrate knowledge of each word as well as an understanding of the relationship between them. Simpson has used this method for evaluation after instruction.

Paired words is an effective approach when students are learning a group of related terms in a content area, but can be used effectively with literature selections as well. This method can be adapted by allowing students to select two words from the list of target words which they can use together in a sentence.
Vocabulary as a Writing Prompt

A competitive writing activity designed by Duin and Graves (1988) effectively encourages students to use new vocabulary words in their writing. Following instruction on a related group of words the students write essays on the topic of the unit of study. Students then read their stories aloud to a group of judges. One person keeps a count of the number of times each target word is used in the composition while other monitors record correct or incorrect usage of the target words. Based on criteria established by the group, winners are announced and awards presented.

There are many other ways to employ vocabulary in writing activities. Social studies units lend themselves to writing authentic newspaper articles about historical events, or diaries historical figures might have kept, or letters they might have sent. Students can write scripts for skits or plays which contain target words. Posting a list of words from the unit prominently helps students use them more frequently.

Students can write letters to characters in stories and books they read, or to the authors whose
works they enjoy. Creative writing and daily journals are other vehicles for the use of new words.
RESOURCES


Tsai, C. & Derry, S. J. (1987, February). Application of schema theory to the instruction of arithmetic word problem solving skills. Paper presented at the annual convention of the Association for Educational Communications and Technology, Atlanta, GA.

